

ORIGINAL
(Red)

R-585-4-5-17
SITE INSPECTION OF
SUFFOLK TOWN GAS
PREPARED UNDER

TDD NO. F3-8307-45
EPA NO. VA-230
CONTRACT NO. 68-01-6699

FOR THE

HAZARDOUS SITE CONTROL DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

JUNE 10, 1985

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY

(b) (4)

BIOLOGIST/PUBLIC
HEALTH SPECIALIST

REVIEWED BY

(b) (4)

ASSISTANT MANAGER

APPROVED BY

(b) (4)

MANAGER, FIT III

TABLE OF CONTENTS

<u>SECTION</u>		ORIGINAL (Red) <u>PAGE</u>
1.0	INTRODUCTION	1-1
1.1	AUTHORIZATION	1-1
1.2	SCOPE OF WORK	1-1
1.3	SUMMARY	1-1
2.0	THE SITE	2-1
2.1	LOCATION	2-1
2.2	SITE LAYOUT	2-1
2.3	OWNERSHIP HISTORY	2-1
2.4	SITE USE HISTORY	2-1
2.5	PERMIT AND REGULATORY ACTION HISTORY	2-2
2.6	REMEDIAL ACTION TO DATE	2-2
3.0	ENVIRONMENTAL SETTING	3-1
3.1	WATER SUPPLY	3-1
3.2	SURFACE WATERS	3-1
3.3	GEOLOGY AND SOILS	3-2
3.4	GROUND WATERS	3-2
3.5	CLIMATE METEOROLOGY	3-3
3.6	LAND USE	3-3
3.7	POPULATION DISTRIBUTION	3-3
3.8	CRITICAL ENVIRONMENTS	3-3
4.0	WASTE TYPES AND QUANTITIES	4-1
5.0	FIELD TRIP REPORT	5-1
5.1	SUMMARY	5-1
5.2	PERSONS CONTACTED	5-1
5.2.1	PRIOR TO FIELD TRIP	5-1
5.2.2	AT THE SITE	5-1
5.3	SAMPLE LOG	5-2
5.4	SITE OBSERVATIONS	5-3
5.5	PHOTOGRAPH LOG	
5.6	EPA ASSESSMENT FORM	
6.0	LABORATORY DATA	6-1
6.1	SAMPLE DATA SUMMARY	6-1
6.2	QUALITY ASSURANCE REVIEW	6-2
6.2.1	ORGANIC	6-2
6.2.2	INORGANIC	6-5
7.0	TOXICOLOGICAL EVALUATION	7-1
7.1	SUMMARY	7-1
7.2	SUPPORT DATA	7-1

APPENDICES

ORIGINAL
(Red)

A	1.0 COPY OF TDD	A-1
B	1.0 MAPS AND SKETCHES	B-1
	1.1 SITE LOCATION MAP	
	1.2 SITE SKETCH	
	1.3 SAMPLE LOCATION MAP	
	1.4 PHOTOGRAPH LOCATION MAP	
	1.5 SITE PROFILE	
C	1.0 QUALITY ASSURANCE SUPPORT DOCUMENTATION	C-1
D	1.0 LABORATORY DATA SHEETS	D-1

ORIGINAL
(Red)

SECTION 1

ORIGINAL
(Red)

1.0 INTRODUCTION

1.1 Authorization

NUS Corporation performed this work under Environmental Protection Agency Contract No. 68-01-6699. This specific report was prepared in accordance with Technical Directive Document No. F3-8307-45 for the Suffolk Town Gas site located in Suffolk, Virginia.

1.2 Scope of Work

FIT Region III was tasked to perform a site inspection of the Suffolk Town Gas site.

1.3 Summary

On January 17, 1984, FIT III conducted a site inspection of the Suffolk Town Gas site, a 2-acre natural gas distribution facility.

The area of concern at the site is the former location of a waste disposal pit. The pit reportedly measured 6 to 8 feet wide, 35 feet long, and 12 to 15 feet deep. The pit was used on a 1-time basis and has since been filled with sand. During the filling, some of the waste overflowed from the pit and ran downslope, where it is presently located. Analysis of the waste indicates substantial concentrations of several polynuclear aromatic hydrocarbons (PAHs), 2-methylnaphthalene, benzene, dibenzofuran, styrene, and o-xylene. A Quality Assurance Review and Toxicological Evaluation of sample analyses results can be found in sections 6.0 and 7.0 of this report, respectively.

ORIGINAL
(Red)

SECTION 2

ORIGINAL
(Red)

2.0 THE SITE

2.1 Location

The Suffolk Town Gas site is located on Hill Street in Suffolk, Virginia. The site is bordered to the west by the Cedar Hill Cemetery and to the south by tracks of the Norfolk and Western Railroad line.

2.2 Site Layout

The site is approximately 2 acres in size. The area of concern at the site is the former location of a waste pit. The pit area is located approximately 50 to 75 feet east from the western site boundary towards the central portion of the site. Located west of the pit area is a small area currently being filled with various debris. A 100,000-gallon storage tank is located approximately 25 to 50 feet north/northeast of the pit area. An office/warehouse building is located approximately 50 feet east of the pit area. A spur of Norfolk and Western Railroad parallels both the eastern and western site boundaries. These tracks join a main line located south of the site. Paralleling the western railroad is a small stream.

2.3 Ownership History

The plant was opened in 1904 by the Suffolk Gas Company, a privately owned gas manufacturer. In 1952, the firm became the Suffolk Gas Corporation, the present owner and operator.

2.4 Site Use History

The site was first used for the production of synthetic gas from coke (coal). This process was in operation from 1904 to about 1940. At that point, the facility was converted to a propane distribution system. Propane was used until around 1950 when natural gas was substituted. Natural gas has been used ever since.

According to Joe Hood, the distribution superintendent, the on-site waste disposal pit was used only 1 time. A "smaller" tank (size unknown) was dismantled and removed from the site, at which point the tar production residue (amount unknown) was deposited in the pit which was then filled with sand. The pit reportedly measured 6 to 8 feet wide, 35 feet long, and 12 to 15 feet deep. Approximately 100 tons of sand were used to fill the pit. An additional foot of soil was placed on top of the sand. When the pit was filled, the level of tar was allegedly raised to the point where some of the tar eventually oozed out of the pit and ran downslope to rest at the bottom of the ravine adjacent to the railroad tracks, approximately 40 feet from the pit area.

2.5 Permit and Regulatory Action History

No permits were issued and no regulatory action was taken in regard to this disposal area during its period of use.

2.6 Remedial Action To Date

Except the previously mentioned filling of the pit, no remedial action has occurred at the site to date.

ORIGINAL
(Red)

SECTION 3

3.0 ENVIRONMENTAL SETTING

ORIGINAL
(Red)

3.1 Water Supply

The city of Suffolk receives its water supply from the (b) (9) system located approximately (b) (9) from the site in (b) (9). During periods of low water level in the reservoir, this source is supplemented by water from other tidewater area (b) (9).

3.2 Surface Waters

Runoff from the site flows into a small unnamed stream which is adjacent to the site. The distance from the waste material, that was sampled to this stream is approximately 25 feet. According to the United States Department of Agriculture (USDA) Soil Survey, the stream is intermittent. This stream reportedly receives drainage from the storm sewers of downtown Suffolk. After passing the site, the stream flows north for a distance of approximately 1,200 feet before reaching a small wetland area (approximately 15 acres). The stream drains into the Nansemond River which is located 2,000 feet from the site. The Nansemond River originates approximately 1 mile west (upstream) of the confluence with the unnamed stream, near the discharges of Lakes Kilby and Meade. The Nansemond then flows approximately 13 miles northeast before discharging into the James River.

There are no known uses of the unnamed stream which drains the site. According to Charles Martin, of the Virginia Surface Water Control Board (VA SWCB), the Nansemond River is used for recreational boating.

3.3 Geology and Soils

ORIGINAL
(Red)

According to the USDA Soil Survey of Suffolk, Virginia, the area surrounding the Suffolk Gas Corporation Hill Street facility is covered by 2 soil series. These series include the Nansemond Series and the Goldsboro Series. The Nansemond soils are located west of the plant and follow the contour of the stream valley. These soils develop from marine fluvial deposits. Fine sandy loams are characteristic of this group. In addition, they are well drained and are moderately to highly acidic. The Goldsboro Series soils underlie the facility area. These soils are deep and moderately well drained. They are found in loamy marine and fluvial sediments. The soils are fine sandy loams with a weak, fine granular structure. They tend to be slightly acidic.

The Holocene Columbia Group sediments make up the uppermost stratigraphic unit in the Suffolk area. This unit is composed of sands, silts, oxidized clays with local gravel lenses. The unit is 20 to 25 feet thick in the Suffolk area, according to Gene Sicdyla, of the VA SWCB. The unit underlying the Columbia is the Yorktown. The Yorktown Formation is a marine sand unit which grades from a bioclastic sand in the south to a glauconitic-quartz sand in the south. In the Suffolk area, the Yorktown is 100 feet thick. Below the Yorktown is the Calvert Formation, which is a much more silty unit and is some 345 feet thick in the tidewater area.

3.4 Groundwaters

There are several water-bearing zones in the Suffolk area. The shallow zone is the water table. Regionally, this zone is generally within 5 to 10 feet of the ground surface. Based on site observations, the water table is not expected to be encountered within 25 feet from the surface of the pit area (see figure 5).

The Yorktown Formation is the next lower aquifer, yielding water from 40 feet to 140 feet below ground surface. Groundwater in the Suffolk area is not used as a drinking water supply because of its generally poor quality. Due to lithologic changes and grain size distribution, the Yorktown does not usually yield consistently large enough amounts of water to be practical for commercial or domestic use. This is according to Gene Sicdyla, of the VA SWCB.

3.5 Climate and Meteorology

ORIGINAL
(Red)

According to the Soil Conservation Service's, "Soil Survey of City of Suffolk," the average winter temperature is 41°F and the average summer temperature is 86°F. The total annual precipitation is 48 inches, 27 inches of which usually fall in the April through September growing season.

3.6 Land Use

The 4 acre Suffolk Gas Corporation facility is used as a maintenance and metering center. The areas to the east, south, and north are residential. The Cedar Hill Cemetery lies directly to the west of the facility and covers an area of about 25 acres.

3.7 Population Distribution

The population of Suffolk, Virginia is 47,621, according to the 1980 census. The approximate number of people who reside within a 1-mile radius of the facility is 500. The number of Gas Corporation personnel entering the facility daily ranges from between 15 and 20, with 13 people being employed at the site.

3.8 Critical Environments

According to Glenn Kinser, of U.S. Fish and Wildlife Service, except for occasional transient individuals, no Federally listed or protected endangered or threatened species are known to exist in the vicinity of the site.

A small wetland area (approximately 15 acres) is located approximately 1,200 feet north of the site.

The Great Dismal Swamp National Wildlife Refuge is located approximately 2 miles east/southeast of the site.

ORIGINAL
(REV)

SECTION 4

ORIGINAL
(Res)

4.0 WASTE TYPES AND QUANTITIES

The waste disposed of at the site was the residue of synthetic gas production, primarily coal tar. The quantity of waste disposed is unknown; however, it is known not to exceed 180 cubic yards (the uppermost limits of the estimated size of the disposal pit).

Based on the analytical results of the material allegedly originating from the pit, the contaminants present on site include:

acenaphthene	phenanthrene
fluoranthene	pyrene
naphthalene	dibenzofuran
benzo(a)anthracene	2-methylnaphthalene
benzo(b)fluoranthene	benzene
chrysene	ethylbenzene
acenaphthylene	toluene
anthracene	styrene
fluorene	o-xylene

ORIGINAL

SECTION 5

(Red)

5.0 FIELD TRIP REPORT

5.1 Summary

On Tuesday, January 17, 1984, FIT III staff members Bruce Pluta, Michael Cramer, Eugene Dennis, and Arthur Weber conducted a site inspection of the Suffolk Town Gas site located in Suffolk, Virginia.

The weather at the time of the inspection was sunny and cold with a temperature of approximately 35°F.

At this time, 3 aqueous, 3 sediment, 1 soil, and 1 waste sample were collected.

5.2 Persons Contacted

5.2.1 Prior to Field Trip

Mr. Gatland
Manager
Suffolk Gas Corporation
Hill Street
Suffolk, VA 23434
(804) 539-2376

Hans J. Mueller
Director
Bureau of Solid Waste
Management
Department of Health
Commonwealth of Virginia
Richmond, VA 23219
(804) 786-1864

Robert Wickser
Commonwealth of Virginia
Department of Health
Richmond, VA 23219
(804) 786-6322

5.2.2 At The Site

Joseph Hood
Distribution Superintendent
Suffolk Gas Corporation
Hill Street
Suffolk, VA 23434
(804) 539-2376

DD Number 8307-45
PA Number VA 230

5.3 SAMPLE LOG

Site Name

Suffolk Town Gas

[illegible]

ORIGINAL
(Red)

5.4 Site Observations

- o An HNU background of 0.0 ppm was noted.
- o During the preliminary reconnaissance of the site, the following conditions were noted:
 - The stream which is parallel to the western boundary appears to be influenced by road runoff as oil sheens were noted in upstream, as well as downstream, locations. This observation is supported by the fact that the stream reportedly receives storm runoff from downtown Suffolk.
 - The entire site was fenced, including the area at the base of the western slope.
 - No seeps were noted on the gas works side of the stream; however, seeps were noted on the cemetery side of the stream. The seeps were numerous but were mere trickles. The seeps had an oil-like iridescence. The soils under the seep were rust colored.
 - An area of ponded water was noted north of the site. An oil sheen was noted on the pond. This area was located outside of the fence line and upslope of the spilled tar and on-site pit area.
 - An area of what appeared to be "spilled tar" was noted downslope of the site at the base of the hill (ravine). This area was irregularly shaped and was approximately 5 feet in diameter.
- o The area west of the site, between the railroad tracks and the site, was used as a fill for solid waste, primarily construction debris, tree limbs, and some trash (see figure 5).

ORIGINAL

- o During the visit, Mr. Hood indicated that the waste disposal pit was used on a 1-time basis for the disposal of production residue (tar) from a small storage tank which was removed from the site. After the tar was disposed of, the pit was filled with sand. As the pit was filled, tar ran up and over the sides of the pit and downslope to rest at the bottom of the hill. Mr. Hood had no idea how full the pit was before the sand was added, but estimated that the pit was approximately 12 to 15 feet deep, 6 to 8 feet wide, and 35 feet long. He also stated that "tons and tons" of sand fill were placed on top of the tar inside of the pit. He estimated that as much as 100 tons of sand could have been used.
- o The on-site auger sample was taken from the area estimated to be the center of the pit. The first foot was dirt fill. From 13 inches to approximately 3 feet in depth, the sand fill was encountered. The sample identified as "auger no. 1" was a composite of this 1- to 3-foot horizon. While augering odors were noted, no HNU readings were recorded.
- o While the tar sample was taken, identified as "spill material," odors were also noted; however, no HNU readings were noted.
- o Prior to departure from the site, the HNU was rechecked and was discovered to be inoperable; therefore, all on-site HNU readings were declared invalid.

5.5 PHOTOGRAPH LOG

ORIGINAL
(Red)



Photo 1 -
Former Pit location

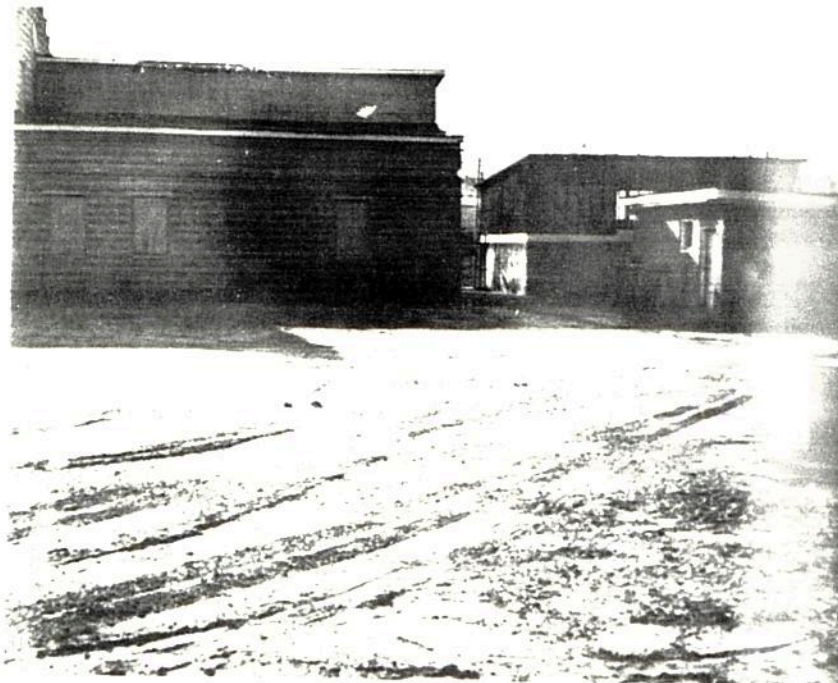
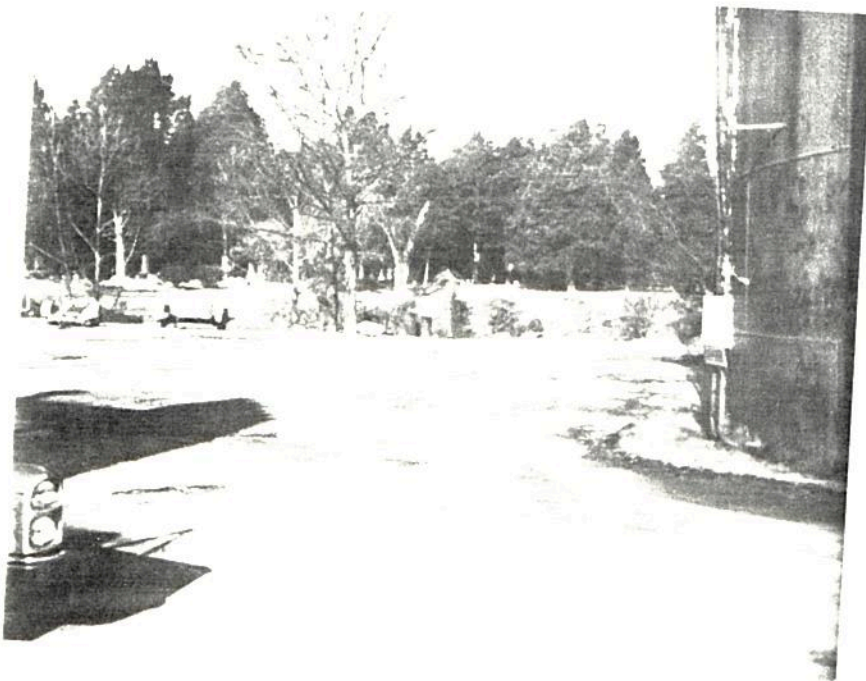
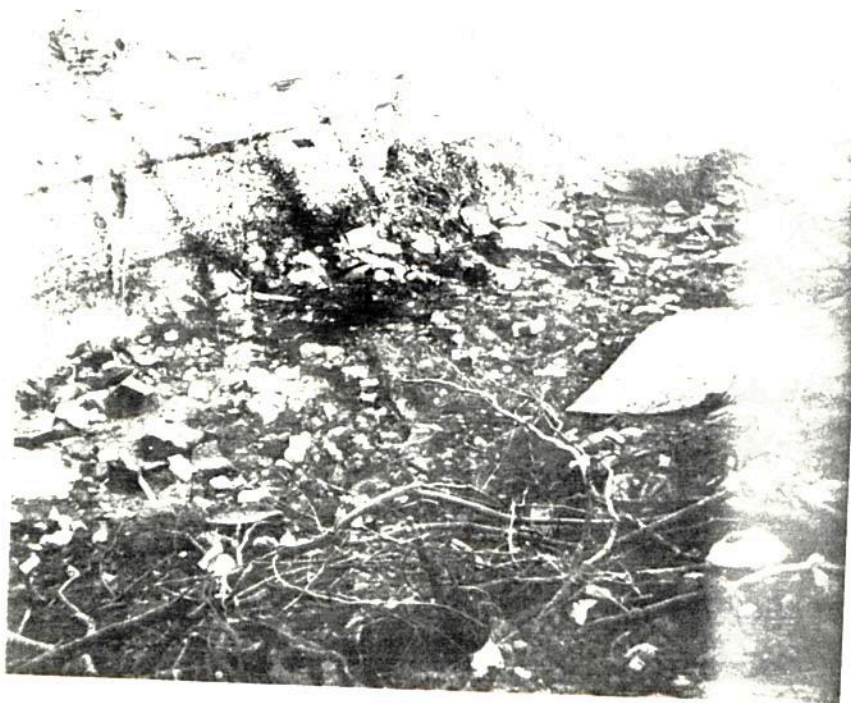


Photo 2 -
Former location of tank which was
removed

ORIGINAL
(Red)



— Photo 3 -
— Location of Pit area as viewed from
— office building.



— Photo 4 -
— Spilled Tar as viewed from the top of
— the "Ravine"

ORIGINAL
(Red)



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION	
01 STATE VA	02 SITE NUMBER 230

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site) Suffolk Town Gas		02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER Hill Street			
03 CITY Suffolk		04 STATE VA	05 ZIP CODE 23434	06 COUNTY City of Suffolk	07 COUNTY CODE 800
09 COORDINATES LATITUDE 36 44 05 LONGITUDE 76 34 38		10 TYPE OF OWNERSHIP (Check one) <input checked="" type="checkbox"/> A. PRIVATE <input type="checkbox"/> B. FEDERAL <input type="checkbox"/> C. STATE <input type="checkbox"/> D. COUNTY <input type="checkbox"/> E. MUNICIPAL <input type="checkbox"/> F. OTHER <input type="checkbox"/> G. UNKNOWN			

III. INSPECTION INFORMATION

01 DATE OF INSPECTION 1 / 17 / 84 MONTH DAY YEAR	02 SITE STATUS <input type="checkbox"/> ACTIVE <input checked="" type="checkbox"/> INACTIVE	03 YEARS OF OPERATION BEGINNING YEAR _____ ENDING YEAR _____ X UNKNOWN
04 AGENCY PERFORMING INSPECTION (Check all that apply) <input type="checkbox"/> A. EPA <input checked="" type="checkbox"/> B. EPA CONTRACTOR NUS Corporation (Name of firm) <input type="checkbox"/> C. MUNICIPAL <input type="checkbox"/> D. MUNICIPAL CONTRACTOR _____ <input type="checkbox"/> E. STATE <input type="checkbox"/> F. STATE CONTRACTOR _____ <input type="checkbox"/> G. OTHER _____ (Specify)		

05 CHIEF INSPECTOR (b) (4)	06 TITLE Biologist (Public Health Specialist)	07 ORGANIZATION NUS	08 TELEPHONE NO. (215) 687-9510
09	10 TITLE Geologist	11 ORGANIZATION "	12 TELEPHONE NO. () "
	Geologist	"	() "
	Engineering Technician	"	() "
			()

13 SITE REPRESENTATIVES INTERVIEWED Joseph Hood	14 TITLE Distribution Superintendent	15 ADDRESS Suffolk Gas Corporation Hill Street Suffolk, VA 23434	16 TELEPHONE NO. (804) 539-2376
			()
			()
			()
			()
			()
			()

17 ACCESS GAINED BY (Check one) <input checked="" type="checkbox"/> PERMISSION <input type="checkbox"/> WARRANT	18 TIME OF INSPECTION 0830	19 WEATHER CONDITIONS Sunny, Cold (approximately 35°)
---	-------------------------------	--

IV. INFORMATION AVAILABLE FROM

01 CONTACT Kevin Green	02 OF (Agency/Organization) Va. Department of Health	03 TELEPHONE NO. (804) 786-6322
(b) (4)	05 AGENCY NUS Corp.	06 ORGANIZATION FIT
	07 TELEPHONE NO. (215) 687-9510	08 DATE 2 / 13 / 84 MONTH DAY YEAR

ORIGINAL
(Red)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
VA	230

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION

03 POPULATION POTENTIALLY AFFECTED: _____

02 ☐ OBSERVED (DATE: _____)

04 NARRATIVE DESCRIPTION

☒ POTENTIAL☐ ALLEGED

Waste was disposed of in an unlined pit.

01 ☒ B. SURFACE WATER CONTAMINATION

03 POPULATION POTENTIALLY AFFECTED: _____

02 ☒ OBSERVED (DATE: 1/17/84)

04 NARRATIVE DESCRIPTION

☐ POTENTIAL☐ ALLEGED

Sample results indicate substantially elevated levels of organic contaminants in the downstream sediments.

01 ☐ C. CONTAMINATION OF AIR

03 POPULATION POTENTIALLY AFFECTED: _____

02 ☐ OBSERVED (DATE: _____)

04 NARRATIVE DESCRIPTION

☐ POTENTIAL☐ ALLEGED

Not observed.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS

03 POPULATION POTENTIALLY AFFECTED: _____

02 ☐ OBSERVED (DATE: _____)

04 NARRATIVE DESCRIPTION

☐ POTENTIAL☐ ALLEGED

Not observed or expected.

01 ☒ E. DIRECT CONTACT03 POPULATION POTENTIALLY AFFECTED: 1302 ☐ OBSERVED (DATE: _____)

04 NARRATIVE DESCRIPTION

☒ POTENTIAL☐ ALLEGED

Exposure to the public is not expected as the site is fenced and the "spill area" is located in an area out of the flow of normal foot traffic. Contaminated soils are accessible to the onsiteworkers

01 ☒ F. CONTAMINATION OF SOIL03 AREA POTENTIALLY AFFECTED: less than .5
(Acres)02 ☒ OBSERVED (DATE: 1/17/84)

04 NARRATIVE DESCRIPTION

☐ POTENTIAL☐ ALLEGED

Onsite soil samples indicate high levels of organic compounds.

01 ☐ G. DRINKING WATER CONTAMINATION

03 POPULATION POTENTIALLY AFFECTED: _____

02 ☐ OBSERVED (DATE: _____)

04 NARRATIVE DESCRIPTION

☐ POTENTIAL☐ ALLEGED

Not expected.

01 ☒ H. WORKER EXPOSURE/INJURY03 WORKERS POTENTIALLY AFFECTED: 1302 ☐ OBSERVED (DATE: _____)

04 NARRATIVE DESCRIPTION

☐ POTENTIAL☐ ALLEGED

Potential exists for workers to contact the on-site contaminated soils.

01 ☐ I. POPULATION EXPOSURE/INJURY

03 POPULATION POTENTIALLY AFFECTED: _____

02 ☐ OBSERVED (DATE: _____)

04 NARRATIVE DESCRIPTION

☐ POTENTIAL☐ ALLEGED

Not expected.

ORIGINAL
(Red)

**POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION**

I. IDENTIFICATION

01 STATE 02 SITE NUMBER

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
<input type="checkbox"/> A. NPDES				
<input type="checkbox"/> B. UIC				
<input type="checkbox"/> C. AIR				
<input type="checkbox"/> D. RCRA				
<input type="checkbox"/> E. RCRA INTERIM STATUS				
<input type="checkbox"/> F. SPCC PLAN				
<input type="checkbox"/> G. STATE (Specify)				
<input type="checkbox"/> H. LOCAL (Specify)				
<input type="checkbox"/> I. OTHER (Specify)				
<input checked="" type="checkbox"/> J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE	04 TREATMENT (Check all that apply)	05 OTHER
<input type="checkbox"/> A. SURFACE IMPOUNDMENT			<input type="checkbox"/> A. INCINERATION	<input checked="" type="checkbox"/> A. BUILDINGS ON SITE
<input type="checkbox"/> B. PILES			<input type="checkbox"/> B. UNDERGROUND INJECTION	
<input type="checkbox"/> C. DRUMS, ABOVE GROUND			<input type="checkbox"/> C. CHEMICAL/PHYSICAL	
<input type="checkbox"/> D. TANK, ABOVE GROUND			<input type="checkbox"/> D. BIOLOGICAL	
<input type="checkbox"/> E. TANK, BELOW GROUND			<input type="checkbox"/> E. WASTE OIL PROCESSING	
<input type="checkbox"/> F. LANDFILL			<input type="checkbox"/> F. SOLVENT RECOVERY	
<input type="checkbox"/> G. LANDFARM			<input type="checkbox"/> G. OTHER RECYCLING/RECOVERY	
<input type="checkbox"/> H. OPEN DUMP			<input checked="" type="checkbox"/> H. OTHER None (Specify)	
<input checked="" type="checkbox"/> I. OTHER Waste Pit (Specify)	Unknown			

06 AREA OF SITE

2

(Acres)

07 COMMENTS

Synthetic gas production residue (coal tar) from a dismantled storage tank was disposed of in an unlined pit onsite. The pit was then filled with sand, causing some of the tar to run out over the sides of the pit and downslope of the site.

IV. CONTAINMENT**01 CONTAINMENT OF WASTES (Check one)**
☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☒ D. INSECURE, UNSOUND, DANGEROUS
02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

See Part 4 Section III, o7.

V. ACCESSIBILITY
01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO
02 COMMENTS

Accessible to onsite workers; area is fenced so the general population is unlikely to contact the waste.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

FIT III site observations and onstie interviews on 1/17/84.

ORIGINAL
(Red)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
VA	230

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-5} - 10^{-6}$ cm/sec ☒ B. $10^{-4} - 10^{-5}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE
(Less than 10^{-6} cm/sec) ☒ B. RELATIVELY IMPERMEABLE
($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE
($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE
(Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK

est. 10- (ft)

04 DEPTH OF CONTAMINATED SOIL ZONE

1 to 15 (ft)

05 SOIL pH

Unknown

06 NET PRECIPITATION

12 (in)

07 ONE YEAR 24 HOUR RAINFALL

3 (in)

08 SLOPE
SITE SLOPE
apprx. 40%DIRECTION OF SITE SLOPE
WestTERRAIN AVERAGE SLOPE
3-5 %

09 FLOOD POTENTIAL

SITE IS IN N/A YEAR FLOODPLAIN

10

N/A

☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE

OTHER

A. (mi)

B. .25 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

N/A (mi)

ENDANGERED SPECIES: N/A

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL

RESIDENTIAL AREAS, NATIONAL/STATE PARKS,
FORESTS, OR WILDLIFE RESERVESAGRICULTURAL LANDS
PRIME AG LAND AG LAND

A. on site (mi)

B. .07 (mi)

C. N/A (mi)

D. N/A (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site itself is on approximately the same elevation as areas to the east. These areas naturally slope to the west (approximately 3%). The area immediately between the site (water pit) and railroad tracks and adjacent stream drops sharply (approximately 45% slope).

VII. SOURCES OF INFORMATION (Cite specific references, e.g., State files, sample analysis, reports)

USDA Soil Survey
Mitre Corp. Uncontrolled Hazardous Waste Site Ranking System
USGS Orthophotomap, Suffolk Quadrangle, 7.5 minute series
Notes of conversations with Gene Sicdyla of VA, SWCB
FIT III 1/17/84 site observations.

ORIGINAL
(Red)

		POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 7 - OWNER INFORMATION				I. IDENTIFICATION 01 STATE 02 SITE NUMBER VA 230	
II. CURRENT OWNER(S)				PARENT COMPANY (if applicable)			
01 NAME Suffolk Gas Company		02 D+B NUMBER		08 NAME N/A		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) Hill Street		04 SIC CODE 4924		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		12 CITY	13 STATE	14 ZIP CODE	
01 NAME N/A		02 D+B NUMBER		08 NAME N/A		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		12 CITY	13 STATE	14 ZIP CODE	
01 NAME N/A		02 D+B NUMBER		08 NAME N/A		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		12 CITY	13 STATE	14 ZIP CODE	
01 NAME N/A		02 D+B NUMBER		08 NAME N/A		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		12 CITY	13 STATE	14 ZIP CODE	
III. PREVIOUS OWNER(S) (List most recent first)				IV. REALTY OWNER(S) (if applicable list most recent first)			
01 NAME N/A		02 D+B NUMBER		01 NAME N/A		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		05 CITY	06 STATE	07 ZIP CODE	
01 NAME N/A		02 D+B NUMBER		01 NAME N/A		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		05 CITY	06 STATE	07 ZIP CODE	
01 NAME N/A		02 D+B NUMBER		01 NAME N/A		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		05 CITY	06 STATE	07 ZIP CODE	
V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)							
EPA Region III file							

ORIGINAL
(Red)

		POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 9 - GENERATOR/TRANSPORTER INFORMATION				I. IDENTIFICATION	
		01 STATE VA	02 SITE NUMBER 230				
II. ON-SITE GENERATOR							
01 NAME Suffolk Gas Company		02 D+B NUMBER					
03 STREET ADDRESS (P.O. Box, RFD #, etc.) Hill Street		04 SIC CODE 4925					
05 CITY Suffolk	06 STATE VA	07 ZIP CODE 23434					
III. OFF-SITE GENERATOR(S)							
01 NAME N/A		02 D+B NUMBER		01 NAME N/A		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		05 CITY	06 STATE	07 ZIP CODE	
01 NAME N/A		02 D+B NUMBER		01 NAME N/A		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		05 CITY	06 STATE	07 ZIP CODE	
01 NAME N/A		02 D+B NUMBER		01 NAME N/A		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		05 CITY	06 STATE	07 ZIP CODE	
IV. TRANSPORTER(S)							
01 NAME N/A		02 D+B NUMBER		01 NAME N/A		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		05 CITY	06 STATE	07 ZIP CODE	
01 NAME N/A		02 D+B NUMBER		01 NAME N/A		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		05 CITY	06 STATE	07 ZIP CODE	
V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis reports)							
FIT III 1/17/84 onsite interviews							

ORIGINAL
(Red)

SECTION 6

Site Name: Suffolk Town Gas

TDD No.: F3-8307-45

(Red)

6.0 LABORATORY DATA

6.1 Sample Data Summary

Site Name Suffolk Town Gas
Date of Sample 1/17/84

☒ Organic ☐ Inorganic

Compounds Detected

[illegible]

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

◆ Denotes results of questionable qualitative significance based upon quality assurance review of data.

SAMPLE DATA SUMMARY TARGET COMPOUNDS

TDD Number 8307-45
EPA Number NA-230

☒ Organic ☐ Inorganic

Site Name Suffolk Town Gas
Date of Sample 1/17/84

Compounds Detected

Solid sample results reported as
dry weight.

Sample Number	Sample Description and Location	Phase	Units	indeno(1,2,3-cd)pyrene	pyrene	dibenzofuran	2-methylnaphthalene	acrylonitrile	benzene	chlorobenzene	1,1,1-trichloroethane	chloroform	ethylbenzene	methylene chloride	fluorochloro-methane	toluene	Remarks
C4609	Spill Material	SOL	ug/g	38,000	4,700	220,000		2,000				380	32		5,000		Results for this SAMPLE IN PPM
C4610	Blank	SOL	ug/kg										190	8			
C4600	Upstream	AQ	ug/l														
C4602	Downstream	AQ	ug/l														
C4604	Ponded Water	AQ	ug/l	120	270												
C4607	Blank	AQ	ug/l														
C4601	Upstream Sediment	SOL	ug/kg														
C4603	Downstream Sediment	SOL	ug/kg	23,000	4,000	78,000											
C4605	Ponded Water Sediment	SOL	ug/kg	16,000	24,000												
C4606	Auger 1	SOL	ug/kg														
C4608	Blank Sediment	SOL	ug/kg														

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.
 ◇ Denotes results of questionable qualitative significance based upon quality assurance review of data.

ORIGINAL
(Red)

**SAMPLE DATA SUMMARY
TARGET COMPOUNDS**

TDD Number 8307-45
EPA Number V1-030

Site Name Suffolk Town Gas
Date of Sample 1/17/84

☐ Organic ☒ Inorganic

Solid sample results reported as
dry weight.

Compound's Detected

Sample Number	Sample Description and Location	Phase	Units	acetone	styrene	0-xylene	4,4'-DDT	PCB 1254	PCB 1260	Remarks
C4609	Spill Material 1	SOL	ug/g	4,800	2,200	0.16				RESULTS FOR THIS SAMPLE IN PPM
C4610	Blank	SOL	ug/kg							
C4600	Upstream	AQ	ug/l							
C4602	Downstream	AQ	ug/l		10					
C4604	Amended Water	AQ	ug/l							
C4607	Blank	AQ	ug/l							
C4601	Upstream Sediment	SOL	ug/kg					210		
C4603	Downstream Sediment	SOL	ug/kg		77,000			260		
C4605	Amended Water Sediment	SOL	ug/kg							
C4606	Auger 1	SOL	ug/kg	155	12			120		
C4608	Blank Sediment	SOL	ug/kg							

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

◇ Denotes results of questionable qualitative significance based upon quality assurance review of data.

ORIGINAL
Red

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

Site Name Suffolk Town Gas
Date of Sample 1/17/84

TDD Number 8307-45
EPA Number V4-230

☐ Organic ☒ Inorganic

Compounds Detected

Sample Number	Sample Description and Location	Phase	Units	Aluminum													Remarks
				Chromium	Barium	Beryllium	Cobalt	Copper	Iron	Nickel	Manganese	Zinc	Boron	Vanadium	Silver		
MC2849	Spill material	Solid	mg/kg	4160	11.1	42.3	0.3	2.5	65	7300	7.9	34.4	254		2.5		
MC2850	Blank	Solid	mg/kg							6.7							
MC2829	Upstream	AQ	ug/l	205						2970	45	183	296				
MC2830	Upstream sediment	Solid	mg/kg	15300	22.1	43.9	0.5	6.4	6.7	19700	10.6	87.5	67	33.1			
MC2831	Downstream	AQ	ug/l	795					129	3230		197	152		17		
MC2832	Downstream sediment	Solid	mg/kg	6800	10.3	44.5	0.25	2.6	6.7	9500	5.3	50.5	65.5	14			
MC2833	Ponded Water	AQ	ug/l	870000	1040	5770	92	486	2720	1200000	1490	6490	20600	1650			
MC2845	Ponded Water sediment	Solid	mg/kg	1400	15.2	65	1.1	5.0	20.5	9600	15.6	30.3	202	19			
MC2846	Auger 1	Solid	mg/kg	5340	2.5	10.4	0.25	3.1		6230	4.0	16.2	12.0	9.3			
MC2847	Blank	AQ	ug/l														
MC2848	Blank sediment	Solid	mg/kg							3.3							

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.
 ◇ Denotes results of questionable qualitative significance based upon quality assurance review of data.

**SAMPLE DATA SUMMARY
TARGET COMPOUNDS**

TDD Number 8307-45
EPA Number VA-230

Site Name Suffolk Town Gas
Date of Sample 1/12/14

☐ Organic ☒ Inorganic

Compounds Detected

Sample Number	Sample Description and Location	Phase	Units	Arsenic	Antimony	Selenium	Thallium	Mercury	Tin	Cadmium	Lead	Ammonia	Cyanide	Sulfide	Remarks
MC2849	Spill material	Solid	mg/kg	8.2	5.1	12.5	1.0	.2	1.1	420		16.0			
MC2850	Blank	Solid	mg/kg									9.0			
MC2829	Upstream	AQ	ug/l							25		110			
MC2830	Upstream Sediment	Solid	mg/kg	10.2	0.15		0.3			27		3.6			
MC2831	Down stream	AQ	ug/l				0.2			61					
MC2832	Down stream Sediment	Solid	mg/kg	3.8	0.15		0.15		0.05	37		47			
MC2853	Ponded Water	AQ	ug/l	1000	46	11	14	1.3	33	82	7400	300			
MC2845	Ponded Water Sediment	Solid	mg/kg	10.8	1.5		0.15		0.93	77.5		20			
MC2846	Auger 1	Solid	mg/kg	2.3			0.15			14		11.6			
MC2847	Blank	AQ	ug/l												
MC2848	Blank Sediment	Solid	mg/kg												

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.
 ◇ Denotes results of questionable qualitative significance based upon quality assurance review of data.

ORIGINAL
7/21/11

6.2 Quality Assurance Review

6.2.1 Organic Data: Lab Case 2349

6.2.1.1 Introduction

The findings offered in this report are based upon a general review of all available sample data, blank results, surrogate and matrix spike results, duplicate results, evaluation of confirmations, and target compound matching quality.

6.2.1.2 Qualifiers

It is recommended that this data package be utilized only with the following qualifier statements:

- o The results which may be qualitatively questionable are listed below:

<u>Compound</u>	<u>Samples with Questionable Results</u>
Methylene Chloride	All samples with positive results
Fluorotrichloromethane	C-4605
Toluene	C-4603 and C-4606
Benzene	C-4602, C-4603, and C-4604
Acetone	C-4606
O-xylene	C-4602 and C-4606
Styrene	C-4606
Pyrene	C-4601
Benzo(a)pyrene	C-4604
4,4'-DDT	C-4609

- o Due to a reporting error, the concentration of fluorene was incorrectly reported in sample C-4609 as 380,000 ug/g. The actual concentration is 38,000 ug/g. The correct value has been incorporated into the data summary.

ORIGINAL

The aforementioned results were designated questionable because there is evidence to doubt the presence of these compounds at concentrations less than or similar to the levels reported. However, with certain exceptions listed below, it can be assumed that concentrations significantly greater than the levels reported cannot be present.

- o The actual detection limit for 2,4-dinitrotoluene, pentachlorophenol, and 4-nitrophenol in sample C-4601 may be significantly higher than reported.
- o The actual detection limit for pesticides in samples C-4604 and C-4609 may be significantly higher than reported.
- o Although the presence of 4,4'-DDT was questioned in sample C-4609, if this compound is present, then the actual concentration may be significantly higher than reported.
- o The actual detection limit for 2,3,7,8-TCDD in sample C-4603 may be significantly higher than reported.
- o Per EPA request, tentatively identified compounds which were reported by the laboratory are not included in this report.

6.2.1.3 Findings

- o Field and/or laboratory blank analysis revealed the presence of methylene chloride, fluorotrichloromethane, toluene, benzene, acetone, o-xylene, styrene and pyrene at sufficient levels to question the results for these compounds in the aforementioned samples.

- o The following results may also be artifacts of chromatographic ghosting:

<u>Sample Number</u>	<u>Compounds Reported</u>	<u>Preceding Run</u>
C-4602	benzene, o-xylene	80 ng standard run
C-4603	benzene, toluene	high level sample run
C-4606	toluene, styrene, and o-xylene	run after 3 multilevel standards

ORIGINAL
(Red)

- o The positive result for acetone may be the result of use of acetone as a decontamination solvent.
- o The positive result for 4,4'-DDT in sample C-4609 was questioned since this identification was performed by a dual column GC analysis which is subject to random chromatographic interferences.
- o The result for benzo(a)pyrene in sample C-4604 was questioned since inadequate spectrum matching quality was observed for this compound.
- o Zero recovery was reported for the matrix spike compounds 2,4-dinitrotoluene, pentachlorophenol, and 4-nitrophenol in sample C-4601. Furthermore, zero recovery was reported for the pesticide surrogate spike in samples C-4604 and C-4609.
- o Indeterminant recovery was reported for the 2,3,7,8-TCDD surrogate spike compound in sample C-4603.
- o Tentatively identified compounds were examined only for possible target compound identifications.

6.2.1.4 Summary

The attached Quality Assurance Review has identified the aforementioned areas of concern. Please see the accompanying Support Documentation Appendix for specifics on this Quality Assurance Review.

Report prepared by (b) (4) Date: August 17, 1984

6.2.2 Inorganic Data: Lab Case 2349

ORIGINAL
(Red)

6.2.2.1 Introduction

The findings offered in this report are based upon a general review of all inorganic sample data, blank analysis results, matrix spike results, duplicate analysis results, ICP interference check results, calibration data, and detection limits.

6.2.2.2 Qualifiers

It is recommended that this data packaged be utilized only with the following qualifier statements:

- o The following results may be qualitatively questionable:

<u>Constituent</u>	<u>Sample with Questionable Results</u>
Cyanide	All positive sample results
Mercury	All positive sample results
Silver	All positive sample results
Nickel	MC-2849, MC-2829, MC-2832, and MC-2846
Iron	MC-2829 and MC-2831
Copper	MC-2830, MC-2831, and MC-2832
Cobalt	MC-2849, MC-2832, and MC-2846
Aluminum	MC-2829 and MC-2831

The aforementioned results were designated questionable because there is evidence to doubt the presence of these constituents at concentrations less than or similar to the levels reported. However, it can be assumed that concentrations significantly greater than the levels reported cannot be present.

- o Due to a transcription error, zinc was reported in sample MC-2833 incorrectly. The correct value has been incorporated to the Data Summary.

- o Although the presence of silver and nickel was questioned in sample MC-2849, if these constituents are present, then the reported concentration may not reflect the average concentration present. Similarly, the reported concentration of zinc in sample MC-2829 may not reflect the average concentration of zinc present. (Red)
- o Although there is no reason to suggest that any calculations are in error, it was not possible to verify quantitations of Task II and III metals due to insufficient documentation.
- o Although there is no reason to suggest that any additional sample results are questionable, it was not possible to verify that all positive sample results, within 5 times of the contract required detection limits, are not artifactual.

6.2.2.3 Findings

- o Blank analysis revealed the presence of cyanide, silver, nickel, iron, copper, cobalt, and aluminum at sufficient levels to question the aforementioned sample results.
- o Positive results for mercury were questioned due to suspected laboratory contamination. In particular, an implausibly high frequency of positive results were observed in the raw data. The laboratory analyzed the samples from this case within 2 weeks of 4 other (unrelated) Region III cases, and 38 out of 41 actual field samples from all 5 projects were positive for mercury. (Furthermore, raw data indicates 5 unidentified additional projects which were analyzed concurrently with these cases also exhibit this abnormally high frequency of mercury contamination.) Consequently, all positive results within 2 standard deviations of the mean of these results were questioned because the observed frequency of positive results is implausibly large, considering the number of samples and unrelated projects involved. Reagent contamination is suspected, but cannot be proven since the laboratory has reported not-detected for all associated blanks. Furthermore, the lack of blank contamination suggest that blanks were not processed under equivalent conditions and procedures as actual field samples.

- o Laboratory duplicate analysis revealed poor precision for silver and nickel in sample MC-2849, and zinc in sample MC-2829.
- o For Task II and III metals, raw data consisted only of final concentrations and did not include absorbance measurements. Consequently, calculation errors relative to the conversion of absorbance to concentration units cannot be ruled out.
- o For Task II and III metals, all blank results did not include reporting of values greater than instrument detection limits, but less than contract required detection limits (CRDL). Consequently, blank contamination at levels just below the CRDL cannot be ruled out.

6.2.2.4 Summary

The attached Quality Assurance Review has identified the aforementioned areas of concern. Please see the accompanying Support Documentation Appendix to this report for specifics on this Quality Assurance Review. In particular, although all positive cyanide results have been questioned because of blank contamination, the raw data has still been requested from the analysis laboratory.

Report prepared by

(b) (4)

Date: July 31, 1984

ORIGINAL
(Red)

SECTION 7

ORIGINAL
(Red)

7.0 TOXICOLOGICAL EVALUATION

7.1 Summary

Substantial concentrations of several polynuclear aromatic hydrocarbons (PAHs), 2-methylnaphthalene, benzene, dibenzofuran, styrene, and o-xylene were reported in the sample of spill material taken on the Suffolk Town Gas site. Reported contaminant concentrations in this sample are sufficiently high that direct contact may result in dermatitis and burning, as well as phototoxic and photoallergic effects. The proportions of potentially carcinogenic PAHs reported in the spill sample are low; nevertheless, repeated or prolonged contact with them may result in an increased carcinogenic risk.

Other on-site samples revealed lower levels of PAHs, 2-methylnaphthalene, and dibenzofuran. Some transport of contaminants reported on site is suggested by the presence of PAHs, 2-methylnaphthalene, and dibenzofuran in the downstream intermittent stream sediment sample taken off site.

The ponded water sample revealed notable concentrations of several toxic heavy metals and arsenic. With the exception of lead, significant concentrations of metals and arsenic were not reported in other on-site samples. Samples from the intermittent stream also indicated higher lead concentrations in the downstream sample. The reported concentrations of these inorganic contaminants should not pose imminent threats to human health via likely exposure routes.

7.2 Support Data

A sample of spill material, taken from a ravine near the western boundary of the Suffolk Town Gas site, was heavily contaminated with numerous PAHs. PAHs are common constituents of coal tar, which had reportedly been disposed of on site. The sample of spill material revealed total PAH concentrations of about 700,000 mg/kg (70 percent).

ORIGINAL
(Red)

Individual PAHs reported at the highest concentrations include naphthalene (350,000 mg/kg), acenaphthalene (110,000 mg/kg), and phenanthrene (71,000 mg/kg).

Note that, while substantial concentrations of PAHs were reported in the sample, it is likely that the sample did not consist of as much as 70 percent PAHs. Contract laboratory data for this sample indicate that very large dilutions were used; such dilutions affect the accuracy of the final calculations. It may be assumed, however, that significant concentrations of PAHs were present in this sample.

PAHs comprise a diverse class of compounds consisting of substituted and unsubstituted polycyclic and heterocyclic aromatic rings. They are formed as a result of incomplete combustion of organic compounds and appear in food as well as ambient air and water. Numerous PAH compounds are distinctive in their ability to produce tumors in the skin and most epithelial tissues of practically all species tested. Malignancies are often induced by acute exposure to microgram quantities of PAHs and latency periods can be short (4 to 6 weeks in mice).

It is important to note that few PAHs that are suspected carcinogens were reported in the spill sample. Potential carcinogens, benzo(a)anthracene (12,000 mg/kg) and benzo(b)fluoranthene (16,000 mg/kg), were measured in this sample; however, other potentially carcinogenic PAHs that are commonly reported in PAH mixtures, such as benzo(a)pyrene and benzo(ghi)perylene were not reported. Total concentration of benzo(a)anthracene and benzo(b)fluoranthene comprised only about 2.8 percent of the total sample weight. Nevertheless, repeated or prolonged contact with the reported concentrations of potentially carcinogenic PAHs may result in some increased carcinogenic risk, as PAHs are dermally absorbed.

Reported concentrations of PAHs in the spill sample are sufficiently high that direct contact may also pose non-carcinogenic risks. Dermal application of high concentrations of various PAHs can cause irritation and burning, as well as papular and vasicular eruptions. Phototoxic and photoallergic effects are also possible. While access to the general population is restricted, note that workers on the Suffolk Town Gas site may have the opportunity for direct contact with the spill material. Such contact should be avoided.

ORIGINAL
(Red)

PAHs were also reported in all other aqueous and sediment samples taken on site. The composite auger sample (taken to a depth of 3 feet) from the waste disposal pit revealed about 387 mg/kg PAHs (total concentration). This sample consisted primarily of fill material overlying the coal tar waste reportedly placed in the pit. Concentrations of PAHs that may be present below the surface dirt and sand cannot be determined from currently available information. Toxic threats posed by the coal tar waste are expected to be minimal provided the sand and dirt covering the material remains intact, thereby reducing opportunity for direct contact.

Aqueous and sediment samples taken from an area of ponded water located upslope of the disposal pit revealed about 1.8 mg/l and 130 mg/kg total PAHs, respectively. The substantially lower PAH concentrations reported in the auger, ponded water, and sediment samples would not be expected to pose serious threats via likely routes of exposure.

While no HNU readings were obtained on site, due to an instrument malfunction, odors were noticed during the site inspection. PAHs are not significantly volatile and it is not expected that notable PAH concentrations would be present in the breathing zone on the Suffolk Town Gas site.¹

It would appear that transport of waste material in the disposal pit is likely only if washout of the pit contents were to occur (flooding, for example). The overflow of the pit, which lead to the deposition of tar-like material at the base of the hill, was apparently a one-time occurrence. It is also not likely that PAHs would be conveyed with surface water as they are relatively water insoluble as a class and undergo photolysis following any dissolution that may occur. The water-insolubility as well as soil-adsorbing tendency of PAHs also suggests that conveyance with percolating water to underlying groundwater is not likely.

Transport of soil or sediment-bound PAHs is possible, however. A sample from a stream which parallels the Suffolk Town Gas site revealed about 130 mg/kg total PAHs in the downstream sediment. The overlying water revealed only naphthalene (22 ug/l) above analytical detection limits. This stream receives surface runoff from the town of Suffolk and from nearby railroad tracks which could contribute to PAH levels in the stream sediment. (PAHs are common urban contaminants and are a major constituent of creosote, which is commonly used to treat railroad ties). Note, however, that the stream sample taken upstream of the site revealed no reliable evidence of PAHs above analytical detection limits, suggesting that the presence of these contaminants in the downstream sediment sample may be site related. Although there are no known users of the intermittent stream, the reported sediment PAH concentration would not be expected to pose a significant threat to aquatic life.

A large number of PAHs have been identified in living matter, and data collected from field and laboratory studies indicate that organisms throughout the phylogenetic scale can incorporate and metabolize PAHs (Radding, et al., 1976).² PAHs with 4 or fewer aromatic rings are rapidly metabolized; those with more than 4 rings (such as benzo(a)pyrene and benzo(ghi)perylene) are metabolized more slowly.

In addition to PAHs, the spill sample also revealed a substantial concentration (220,000 mg/kg or 22 percent) of a related compound, 2-methylnaphthalene.

Methylnaphthalene is utilized as a component of slow release insecticides, in mole repellants, and often in combination with naphthalene. Very limited dose-response information is available for methylnaphthalene, and animal studies suggest low to moderate acute oral toxicity.³ In contrast to the related PAH compounds, methylnaphthalene is not a human skin irritant or photosensitizer.

It should be noted, however, that 2-methylnaphthalene may provide a vehicle that would enhance dermal absorption of PAHs. The auger sample taken from the disposal pit revealed 110 mg/kg of 2-methylnaphthalene; off-site transport of this contaminant is suggested by its presence at a concentration of 78 mg/kg in the downstream sediment sample taken from the intermittent stream.

Other notable organics reported in the spill sample include 2,000 mg/kg of the human carcinogen benzene and 9,700, 4,800, and 2,200 mg/kg of the non-priority pollutant substances dibenzofuran, styrene, and o-xylene, respectively. While the concentrations of these contaminants were generally lower than those reported for PAHs, note that direct contact with these contaminants may also result in adverse effects. Benzene, for example, is a leukemogenic agent which can be absorbed dermally. Repeated or prolonged direct contact with styrene, xylene, and benzene may lead to drying and defatting of the skin which may lead to dermatitis. Insufficient toxicity information is available to predict possible adverse effects that may result from direct contact with dibenzofuran.

Lower levels of dibenzofuran (4 mg/kg) and xylene (77 mg/kg) were reported in the intermittent stream sediment sample taken downstream of the site. The auger sample taken from the disposal pit revealed 8.4 mg/kg dibenzofuran. None of the previously noted contaminants were reliably reported in the remaining on- or off-site samples.

A low level (120 ug/kg) of the persistent and highly bioaccumulative compound, PCB 1254, was reported in the auger sample 1. A related mixture, PCB 1260, was reported in both up- (210 ug/kg) and downstream (260 ug/kg) intermittent stream samples, suggesting that their presence in stream sediments may not be site related. The low PCB levels reported in auger and stream sediment samples would not be expected to pose serious toxic threats in this case.

Substantial concentrations of several toxic metals and arsenic were reported in the ponded water sample. Reported metal and arsenic concentrations were as follows: arsenic (1,000 ug/l), cadmium (82 ug/l), lead (7,400 ug/l), chromium (1,040 ug/l), beryllium (92 ug/l), copper (2,720 ug/l), iron (1,200,000 ug/l), nickel (1,410 ug/l), and zinc (20,600 ug/l). The reported concentrations of these metals may be toxic to aquatic life, although the ponded water does not support aquatic fauna. The concentrations of metals and arsenic reported in the ponded water are sufficiently high to possibly have local impact (on plants, for example). The variety of metals reported at elevated concentrations in the ponded water sample is curious, and there is no evidence to indicate that it is site related. (Note that the ponded water was located outside the fenced-in area on site.) With the exception of lead (reported in the spill material and other site samples at concentrations of 420 to 14 mg/kg), none of the above-noted parameters were reported at elevated concentrations in spill material or other on-site samples.

Samples from the intermittent stream revealed elevated concentrations of lead and zinc; no other toxic metals were reported at concentrations of concern. Lead concentrations reported in both up- and downstream aqueous samples (25 and 61 ug/l, respectively) exceeded the proposed criterion for the protection of aquatic life of 1.0 ug/l in soft water. Corresponding sediment lead concentrations were within ranges generally reported in U.S. soils.⁴ The higher lead concentration reported in the downstream aqueous sample (61 ug/l) may suggest site-related transport of lead. Zinc was also reported in the intermittent stream at concentrations greater than that considered protective of aquatic life. Note, however, that the upstream aqueous zinc concentration (296 ug/l) exceeded the downstream aqueous zinc concentration (152 ug/l). There are currently no known users of the intermittent stream which flows to the Nansemond River, approximately 2,000 feet from the site.

ORIGINAL
(Red)

Site Name: Suffolk Town Gas
TDD No.: F3-8307-45

The current status of shallow groundwater beneath the Suffolk site cannot be assessed, as there are no monitoring wells on site. Groundwater in the vicinity is not used for potable purposes because its generally poor quality. The potential may exist for some of the contaminants (such as arsenic or lead) reported in the ponded water to leach under certain environmental conditions.

Prepared by:

(b) (4)



Date: March 5, 1985

LIST OF SOURCES

1. U.S. Environmental Protection Agency. 1979. Water-Related Environmental Fate of 129 Priority Pollutants (Monitoring and Data Support Division). EPA 440/4-79-0296.
2. Radding, S.B., et al. 1976. The environmental fate of selected polynuclear aromatic hydrocarbons. U.S. Environmental Protection Agency (Office of Toxic Substances). EPA 560/5-75-009.
3. National Institute for Occupational Health and Human Services. 1980. Registry of Toxic Effects of Chemical Substances (U.S. Department of Health and Human Services). NIOSH 80-III.
4. Allaway, W.H. 1968. Agronomic controls over the environmental cycling of trace elements. Adv. Agron. 20:235-274.